

REMARKS

Claims 4-7 are all of the pending claims, with claims 4 and 7 being written in independent form.

The Examiner rejects claims 4 -7 under 35 U.S.C. § 103(a) as being obvious over US 4,511,252 to Di Matteo et al. (“Di Matteo”) in view of US 5,905,545 to Poradish et al. (“Poradish”) and US 5,410,609 to Kado et al. (“Kado”). Applicants respectfully traverse this rejection in view of the following remarks.

A. Independent Claim 4:

Independent claim 4 defines a method that involves (among other things): (1) projecting encoded illumination patterns onto an object surface “*for identification of at least three depth planes of said object in a single image;*” and (2) determining a three-dimensional image of a topography of the object surface using at least “*triangulation principles.*” The identification of at least three depth planes of said object in a single image (item (1)) means that three images, which can be respectively distinguished (e.g., based on color), may be recorded simultaneously in a single image. Further, as is well known in this art, triangulation (item (2)) refers to the process of finding a distance to a point by calculating the length of one side of a triangle, given measurements of angles and sides of the triangle formed by that point and two other reference points. At least these features (as recited in independent claim 4), in combination with the other features recited in independent claim 4, are not taught or suggested by the prior art relied upon by the Examiner.

The Examiner relies heavily upon the Di Matteo reference to teach all of the features of the present invention, except for a digital micro-mirror arrangement and evaluating a three-

dimensional image, as defined by independent claim 4. Therefore, the Examiner looks to the secondary references of Poradish and Kado to allegedly teach these feature. This rejection position is not convincing, however, because the Examiner's heavy reliance upon Di Matteo is misplaced. Specifically, Di Matteo does not teach or suggest the features upon which the Examiner relies to reject claim 4.

The "Three Depth Planes" Feature

The Examiner concludes that Di Matteo's method involves projecting illumination patterns onto the object surface for identification of at least three depth planes of the object in a single image. Applicants agree that Di Matteo illuminates the object with three colors. However, as clearly shown in Fig. 5, the colors are respectively assigned to specific regions on the surface. In this regard, the regions illuminated with different colors form a *single image* of the object surface, not three images thereof. Certainly then, Di Matteo's method does *not* involve projecting illumination patterns onto the object surface for identification of at least three depth planes of the object in a single image. The Examiner's assertions to the contrary are tenable only by placing a strained interpretation on the reference.

The "Triangulation Principles" Feature

The Examiner concludes that Di Matteo's method involves determining a three-dimensional image of a topography of the object surface using triangulation principles. However, Di Matteo's straightforward disclosure expressly indicates otherwise. Specifically, Di Matteo indicates that the spatial position of a point on the object surface may be determined using an *interpolation* technique. The interpolation technique is described with reference to Fig. 8. (See col. 7, lines 56+). Here, a photograph of a band of the object surface includes a point P. The image of that band on the photograph appears as an outline 60. A photograph 58 (see Fig. 7)

of a reference surface is superimposed onto the photograph containing the outline 60. The spatial position of the point P may then be located by *interpolation* with respect to the neighboring points of intersection 58a and 58b. Points 58d and 58c are used for *interpolating* to point P from points 58a and 58b, respectively.

As is well-known in this art, *interpolation* is a method of constructing new data points (e.g., the point P) from a discreet set of known data points (e.g., 58a, 58b, 58c and 58d). Applicants respectfully submit that Di Matteo's interpolation technique is simply not pertinent to determining a three-dimensional image of a topography of an object surface using at least triangulation principles, as recited in independent claim 4.

Turning to the next point, the Examiner cites several portions of the Di Matteo reference as allegedly teaching triangulation principles. However, all of the cited portions merely explain the details of the interpolation technique noted above. Indeed, all of the cited portions relate to the superimposing of a reference surface photograph onto an object surface photograph so that spatial coordinates of a point in the object surface photograph may be solved for as the intersection between a plane and a line obtained from the position of the point in the image. Certainly then, the cited portions of Di Matteo are not pertinent to a technique that involves triangulation principles. The Examiner's assertions to the contrary are tenable only by placing a strained interpretation on the reference.

Applicants respectfully submit that the secondary references to Poradish and Kado do not make up for the deficiencies of Di Matteo noted above. Accordingly, even if combined in the manner suggested by the Examiner, the prior art would still not meet each and every feature of the invention defined by independent claim 4.

B. Independent Claim 7:

Independent claim 7 is somewhat similar to independent claim 4 to the extent that claim 7 recites (among other things) a “*three depth planes*” and “*triangulation principles*” features. Accordingly, Applicants respectfully submit that independent claim 7 is patentable for reasons analogous to those noted above with respect to independent claim 4.

CONCLUSION

In view of the above, Applicants earnestly request reconsideration of all pending rejections and allowance of each of claims 4-7.

Applicants hereby petition under the provisions of 37 C.F.R. § 1.136(a) for a one (1) month extension of time in which to respond to the January 12, 2005 Office Action and submit the required \$120.00 extension fee herewith.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number of the undersigned below

REQUEST FOR RECONSIDERATION UNDER RULE 116
Appl. No. 09/381,839

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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